A88XM-E/USB 3.1

E11448 First Edition March 2016

Copyright © 2016 ASUSTeK COMPUTER INC. All Rights Reserved.

No part of this manual, including the products and software described in it, may be reproduced, transmitted, transcribed, stored in a retrieval system, or translated into any language in any form or by any means, except documentation kept by the purchaser for backup purposes, without the express written permission of ASUSTeK COMPUTER INC. ("ASUS").

Product warranty or service will not be extended if: (1) the product is repaired, modified or altered, unless such repair, modification of alteration is authorized in writing by ASUS; or (2) the serial number of the product is defaced or missing.

ASUS PROVIDES THIS MANUAL "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OR CONDITIONS OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. IN NO EVENT SHALL ASUS, ITS DIRECTORS, OFFICERS, EMPLOYEES OR AGENTS BE LIABLE FOR ANY INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES (INCLUDING DAMAGES FOR LOSS OF PROFITS, LOSS OF BUSINESS, LOSS OF USE OR DATA, INTERRUPTION OF BUSINESS AND THE LIKE), EVEN IF ASUS HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES ARISING FROM ANY DEFECT OR ERROR IN THIS MANUAL OR PRODUCT.

SPECIFICATIONS AND INFORMATION CONTAINED IN THIS MANUAL ARE FURNISHED FOR INFORMATIONAL USE ONLY, AND ARE SUBJECT TO CHANGE AT ANY TIME WITHOUT NOTICE, AND SHOULD NOT BE CONSTRUED AS A COMMITMENT BY ASUS. ASUS ASSUMES NO RESPONSIBILITY OR LIABILITY FOR ANY ERRORS OR INACCURACIES THAT MAY APPEAR IN THIS MANUAL. INCLUDING THE PRODUCTS AND SOFTWARE DESCRIBED IN IT.

Products and corporate names appearing in this manual may or may not be registered trademarks or copyrights of their respective companies, and are used only for identification or explanation and to the owners' benefit. without intent to infringe.

Offer to Provide Source Code of Certain Software

This product contains copyrighted software that is licensed under the General Public License ("GPL"), under the Lesser General Public License Version ("LGPL") and/or other Free Open Source Software Licenses. Such software in this product is distributed without any warranty to the extent permitted by the applicable law. Copies of these licenses are included in this product.

Where the applicable license entitles you to the source code of such software and/or other additional data, you may obtain it for a period of three years after our last shipment of the product, either

(1) for free by downloading it from http://support.asus.com/download

or

(2) for the cost of reproduction and shipment, which is dependent on the preferred carrier and the location where you want to have it shipped to, by sending a request to:

ASUSTEK Computer Inc. Legal Compliance Dept. 15 Li Te Rd., Beitou, Taipei 112 Taiwan

In your request please provide the name, model number and version, as stated in the About Box of the product for which you wish to obtain the corresponding source code and your contact details so that we can coordinate the terms and cost of shipment with you.

The source code will be distributed WITHOUT ANY WARRANTY and licensed under the same license as the corresponding binary/object code.

This offer is valid to anyone in receipt of this information.

ASUSTeK is eager to duly provide complete source code as required under various Free Open Source Software licenses. If however you encounter any problems in obtaining the full corresponding source code we would be much obliged if you give us a notification to the email address gpl@asus.com, stating the product and describing the problem (please DO NOT send large attachments such as source code archives, etc. to this email address).

Contents

Safety inform	nation	iv
About this gu	ıide	i\
Package con	tents	v
A88XM-E/USI	B 3.1 specifications summary	v
Chapter 1:	Product introduction	
1.1 Before	you proceed	1-1
1.2 Mothe	rboard overview	1-1
1.3 Accele	erated Processing Unit (APU)	1-9
1.4 Syster	m memory	1-10
Chapter 2:	BIOS information	
2.1 Manag	ging and updating your BIOS	2-1
2.2 BIOS	setup program	2-5
2.3 Exit m	enu	2-10
Appendices	S	
Notices		A- 1
ASUS contac	t information	A-5

Safety information

Electrical safety

- To prevent electrical shock hazard, disconnect the power cable from the electrical outlet before relocating the system.
- When adding or removing devices to or from the system, ensure that the power cables for the devices are unplugged before the signal cables are connected. If possible, disconnect all power cables from the existing system before you add a device.
- Before connecting or removing signal cables from the motherboard, ensure that all
 power cables are unplugged.
- Seek professional assistance before using an adapter or extension cord. These devices could interrupt the grounding circuit.
- Ensure that your power supply is set to the correct voltage in your area. If you are not sure about the voltage of the electrical outlet you are using, contact your local power company.
- If the power supply is broken, do not try to fix it by yourself. Contact a qualified service technician or your retailer.

Operation safety

- Before installing the motherboard and adding devices on it, carefully read all the manuals that came with the package.
- Before using the product, ensure all cables are correctly connected and the power cables are not damaged. If you detect any damage, contact your dealer immediately.
- To avoid short circuits, keep paper clips, screws, and staples away from connectors, slots, sockets and circuitry.
- Avoid dust, humidity, and temperature extremes. Do not place the product in any area where it may become wet.
- Place the product on a stable surface.
- If you encounter technical problems with the product, contact a qualified service technician or your retailer.

About this guide

This user guide contains the information you need when installing and configuring the motherboard.

How this guide is organized

This guide contains the following parts:

Chapter 1: Product introduction

This chapter describes the features of the motherboard and the new technology it supports.

Chapter 2: BIOS information

This chapter tells how to change system settings through the BIOS Setup menus. Detailed descriptions of the BIOS parameters are also provided.

Where to find more information

Refer to the following sources for additional information and for product and software updates.

1. ASUS websites

The ASUS website provides updated information on ASUS hardware and software products. Refer to the ASUS contact information.

2. Optional documentation

Your product package may include optional documentation, such as warranty flyers, that may have been added by your dealer. These documents are not part of the standard package.

Conventions used in this guide

To ensure that you perform certain tasks properly, take note of the following symbols used throughout this manual.



DANGER/WARNING: Information to prevent injury to yourself when trying to complete a task.



CAUTION: Information to prevent damage to the components when trying to complete a task



IMPORTANT: Instructions that you MUST follow to complete a task.



NOTE: Tips and additional information to help you complete a task.

Typography

Bold t	ext	Indicates a menu or an item to select.
Italics		Used to emphasize a word or a phrase.
<key></key>		Keys enclosed in the less-than and greater-than sign means that you must press the enclosed key.
		Example: <enter> means that you must press the Enter or Return key.</enter>
<key1< th=""><th>> + <key2> + <key3></key3></key2></th><th>If you must press two or more keys simultaneously, the key names are linked with a plus sign (+).</th></key1<>	> + <key2> + <key3></key3></key2>	If you must press two or more keys simultaneously, the key names are linked with a plus sign (+).

Package contents

Check your motherboard package for the following items.

Motherboard	ASUS A88XM-E/USB 3.1 motherboard	
Cables	2 x Serial ATA 6.0 Gb/s cables	
Accessories	1 x I/O Shield	
Application DVD	Support DVD	
Documentation	User Guide	



If any of the above items is damaged or missing, contact your retailer.

A88XM-E/USB 3.1 specifications summary

CPU	AMD® Socket FM2+ for A- series / Athlon™Series Processors		
	Supports CPU up to 4 cores		
	AMD® Turbo Core Technology 3.0 support*		
	* The AMD® Turbo Core Technology 3.0 support depends on the APU types.		
	** Refer to <u>www.asus.com</u> for AMD [®] APU support list.		
Chipset	AMD® A88X FCH		
Memory	2 x DDR3 DIMM, max. 32GB, DDR3 2400(O.C.)/2133/1866/1600/1333 MHz, non-ECC un-buffered memory Dual Channel memory architecture		
	* The max. 32GB memory capacity can be supported with DIMMs of 16GB (or above). ASUS will update QVL once the DIMMs are available on the market.		
	** Refer to <u>www.asus.com</u> for the latest Memory QVL (Qualified Vendors List).		
	*** Due to OS limitation, when installing total memory of 4GB capacity or more, Windows® 32-bit operation system may only recognize less than 3GB. Install a 64-bit Windows® OS when you want to install 4GB or more memory on the motherboard.		
	**** Hyper DIMM support is subject to the physical characteristics of individual CPUs.		
Expansion slots	1x PCI Express 3.0*/2.0 x16 slot		
	1 x PCI Express 2.0 x1 slot		
	1 x PCI slot		
	* Only FM2+ APU can support PCle 3.0.		
Storage	AMD® A88X FCH:		
	 6 x Serial ATA 6Gb/s connectors(Grey) with RAID 0, RAID 1, RAID 5,RAID 10, and JBOD support 		
LAN	Realtek® 8111H Gigabit LAN Controller		
USB	ASMedia USB 3.1 controllers - supports ASUS USB 3.1 Boost		
	-2 x USB 3.1 ports (2 ports at back panel,teal blue)		
	AMD® A88X FCH:		
	- 4 x USB 3.0 ports (2 ports at back panel, 2 ports at mid-board, blue)		
	- 6 x USB 2.0 ports (2 ports at back panel,4 ports at mid-board)		

(continued on the next page)

A88XM-E/USB 3.1 specifications summary

Audio Realtek® ALC887 8-channel High Definition Audio CODEC - LED-illuminated design - Brighten up your build with the gorgeous illuminated audio trace path. - Audio shielding - Ensures precision analog/digital separation and greatly reduced multi-lateral interference - Dedicated audio PCB lavers: Separate lavers for left and right channels to guard the guality of the sensitive audio signals Premium Japanese-made audio capacitors: Provide warm, natural and immersive sound with exceptional clarity and fidelity - Supports jack-detection and front panel jack-retasking ASUS unique ASUS 5X Protection II features - ASUS LANGuard - Protects against LAN surges, lightning strikes and static-electricity discharges! - ASUS ESD Guards - Electrostatic discharge protection - ASUS DIGI+ VRM - 3+2 Phase digital power design -ASUS DRAM Overcurrent Protection - Enhanced DRAM overcurrent - ASUS Stainless Steel Back I/O - 3X corrosion-resistance for greater durability Superb Performance ASUS FPU - EPU **PC Cleaner** - Fast and easy way to get rid of unnecessary junk files **UEFI BIOS** - Most advanced options with fast response time USB 3.1 Boost - Featuring speedy USB 3.1 transmission Gaming Scenario **Audio Features** -Audio that roars on the battlefield Media Streamer - Pipe music or movies from your PC to a smart TV, your entertainment goes wherever you go! - Media Streamer app for portable smartphone/tablet, supporting iOS7 and Android 4.0 system **ASUS Exclusive Features:** - ASUS Disk Unlocker featuring 3TB+ HDD support - ASUS Anti Surge - ASUS Al Charger - ASUS AI Suite 3 **EZ DIY**

(continued on the next page)

- Monitor your PC status with smart devices in real time

Push Notice

A88XM-E/USB 3.1 specifications summary

ASUS unique	UEFI BIOS EZ Mode		
features	- Featuring a friendly graphical user interface		
	- ASUS CrashFree BIOS 3		
	- ASUS EZ Flash 2		
	ASUS Q-Design		
	- ASUS Q-Slot		
Back Panel I/O	1 x PS/2 keyboard port (purple)		
ports	1 x PS/2 mouse port (green)		
	1 x HDMI Port		
	1 x DVI Port		
	1 x D-Sub Output port		
	2 x USB 3.1 ports		
	2 x USB 3.0 ports		
	2 x USB 2.0/1.1 ports		
	1 x LAN (RJ-45) port		
	3 x Audio jacks support 8-channel audio output		
Internal I/O	2 x USB 2.0 connectors support additional 4 USB 2.0 ports		
connectors	1 x USB 3.0 connector supports additional 2 USB 3.0 ports		
	6 x SATA 6.0Gb/s connectors (gray)		
	1 x System panel connector		
	1 x Internal Speaker connector		
	1 x CPU fan connector (4-pin)		
	1 x Chassis Fan connector		
	1 x S/PDIF Out connector		
	1 x High Definition front panel audio connector		
	1 x COM Header		
	1 x 24-pin EATX power connector		
	1 x 4-pin ATX 12V power connector		
BIOS features	64 Mb Flash ROM, UEFI AMI BIOS, PnP, DMI2.0, WfM2.0, SM BIOS 2.7,		
	ACPI 2.0a, Multi-language BIOS, ASUS EZ Flash 2, ASUS CrashFree BIOS 3, F12 PrintScreen Function, F3 Shortcut Function and ASUS DRAM SPD		
	(Serial Presence Detect) memory information		
Support DVD	Drivers		
	ASUS utilities		
	ASUS Update		
	Anti-virus software (OEM version)		
Operating System	Windows® 10 (64-bit)		
Support	Windows® 8.1 (64-bit)		
	Windows® 7 (64-bit)*		
	Windows® XP		
	* Please refer to ASUS official website and download "Windows® 7 installation guide" and "ASUS EZ installer" to install Windows® 7.		
Form factor	mATX form factor: 7.5 in x 8.9 in (19.05 cm x 22.6 cm)		



Specifications are subject to change without notice.

Product introduction



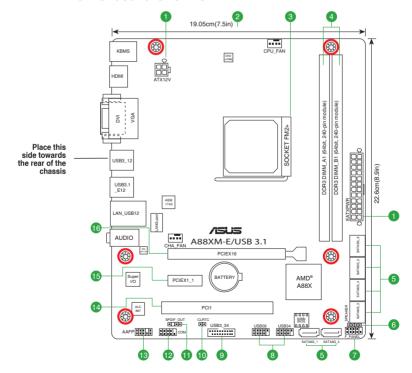
1.1 Before you proceed

Take note of the following precautions before you install motherboard components or change any motherboard settings.



- Unplug the power cord from the wall socket before touching any component.
- Before handling components, use a grounded wrist strap or touch a safely grounded object or a metal object, such as the power supply case, to avoid damaging them due to static electricity.
- Before you install or remove any component, ensure that the ATX power supply is switched off or the power cord is detached from the power supply. Failure to do so may cause severe damage to the motherboard, peripherals, or components.

1.2 Motherboard overview

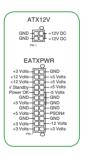


1.2.1 Layout contents

Con	nectors/Jumpers/Slots/LED	Page
1.	ATX power connectors (24-pin EATXPWR, 4-pin ATX12V)	1-2
2.	CPU and chassis fan connectors (4-pin CPU_FAN, 4-pin CHA_FAN)	1-3
3.	AMD® FM2+ APU socket	1-3
4.	DDR3 DIMM slots	1-3
5.	AMD® A88X SATA 6.0Gb/s ports (SATA6G_1~6)	1-3
6.	Speaker connector (4-pin SPEAKER)	1-3
7.	System panel connector (10-1 pin F_PANEL)	1-4
8.	USB 2.0 connector (10-1 pin USB3456)	1-4
9.	USB 3.0 connector (20-1 pin USB3_34)	1-4
10.	Clear RTC RAM (2-pin CLRTC)	1-5
11.	Digital audio connector (4-1 pin SPDIF_OUT)	1-5
12.	Serial Port Connector (10-1 pin COM)	1-5
13.	Front panel audio connector (10-1 pin AAFP)	1-5
14	PCI slot	1-6
15	PCI Express 2.0 x1 slot	1-6
16	PCI Express 3.0/2.0 x16 slot	1-6

1. ATX power connectors (24-pin EATXPWR, 4-pin ATX12V)

These connectors are for ATX power supply plugs. The power supply plugs are designed to fit these connectors in only one orientation. Find the proper orientation and push down firmly until the connectors completely fit.





- We recommend that you use an EATX 12V Specification 2.0-compliant power supply unit (PSU) with a minimum of 300W power rating. This PSU type has 24-pin and 8-pin power plugs.
- DO NOT forget to connect the 4-pin ATX +12V power plug. Otherwise, the system will not boot up.
- We recommend that you use a PSU with higher power output when configuring a system with more power-consuming devices or when you intend to install additional devices. The system may become unstable or may not boot up if the power is inadequate.
- If you are uncertain about the minimum power supply requirement for your system, refer to the Recommended Power Supply Wattage Calculator at http://support.asus.com/PowerSupplyCalculator/PSCalculator.aspx?SLanguage=en-us for details.

CPU and chassis fan connectors (4-pin CPU_FAN, 4-pin CHA FAN)

Connect the fan cables to the fan connectors on the motherboard, ensuring that the black wire of each cable matches the ground pin of the connector.





Do not forget to connect the fan cables to the fan connectors. Insufficient air flow inside the system may damage the motherboard components. These are not jumpers! Do not place jumper caps on the fan connectors! The CPU_FAN connector supports a CPU fan of maximum 1A (12 W) fan power.

3. AMD® FM2+ APU socket

This motherboard comes with a FM2+ socket designed for AMD® A-series and Athlon™Series processors.



For more details, refer to Accelerated Processing Unit (APU).

4. DDR3 DIMM slots

Install 2 GB, 4 GB, 8 GB, and 16 GB unbuffered non-ECC DDR3 DIMMs into these DIMM sockets.



For more details, refer to System memory.

5. AMD® A88X SATA 6.0Gb/s ports (7-pin SATA6G 1~6)

These ports connect to SATA 6.0 Gb/s hard disk drives via SATA 6.0 Gb/s signal cables.



When using hot-plug and NCQ, set the **SATA Mode Selection** item in the BIOS to [AHCI].



6. Speaker connector (4-pin SPEAKER)

The 4-pin connector is for the chassis-mounted system warning speaker. The speaker allows you hear system beeps and warnings.



7. System panel connector (10-1 pin F_PANEL)

This connector supports several chassis-mounted functions.

System power LED (2-pin PWR_LED)

This 2-pin connector is for the system power LED. Connect the chassis power LED cable to this connector. The system power LED lights up when you turn on the system power, and blinks when the system is in sleep mode.

Hard disk drive activity LED (2-pin HDD LED)

This 2-pin connector is for the HDD Activity LED. Connect the HDD Activity LED cable to this connector. The HDD LED lights up or flashes when data is read from or written to the HDD.

ATX power button/soft-off button (2-pin PWR_BTN)

This connector is for the system power button.

· Reset button (2-pin RESET)

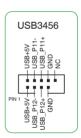
This 2-pin connector is for the chassis-mounted reset button for system reboot without turning off the system power.

8. USB 2.0 connector (10-1 pin USB34, USB56)

This connector is for USB 2.0 ports. Connect the USB module cable to any of this connector, then install the module to a slot opening at the back of the system chassis. These USB connectors comply with USB 2.0 specifications and supports up to 480Mbps connection speed.



Never connect a 1394 cable to the USB connectors. Doing so will damage the motherboard!



F_PANEL

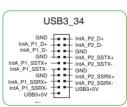
4

+HDD_LED RESET

PWR_ BWR_ GND -

9. USB 3.0 connector (20-1 pin USB3_34)

This connector allows you to connect a USB 3.0 module for additional USB 3.0 front or rear panel ports. With an installed USB 3.0 module, you can enjoy all the benefits of USB 3.0 including faster data transfer speeds of up to 5Gbps, faster charging time for USB-chargeable devices, optimized power efficiency and backward compatibility with USB 2.0.



10. Clear RTC RAM (2-pin CLRTC)

This header allows you to clear the Real Time Clock (RTC) RAM in CMOS. You can clear the CMOS memory of date, and system setup parameters by erasing the CMOS RTC RAM data. The onboard button cell battery powers the RAM data in CMOS, which include system setup information such as system passwords.



To erase the RTC RAM:

- 1. Turn OFF the computer and unplug the power cord.
- 2. Use a metal object such as a screwdriver to short the two pins.
- 3. Plug the power cord and turn ON the computer.
- Hold down the key during the boot process and enter BIOS setup to reenter data.



If the steps above do not help, remove the onboard battery and short the two pins again to clear the CMOS RTC RAM data. After clearing the CMOS, reinstall the battery.

11. Digital audio connector (4-1 pin SPDIF_OUT)

This connector is for an additional Sony/Philips Digital Interface (S/PDIF) port. Connect the S/PDIF Out module cable to this connector, then install the module to a slot opening at the back of the system chassis.



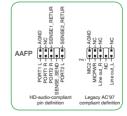
12. Serial port connector (10-1 pin COM)

This connector is for a serial (COM) port. Connect the serial port module cable to this connector, then install the module to a slot opening at the back of the system chassis.



13. Front panel audio connector (10-1 pin AAFP)

This connector is for a chassis-mounted front panel audio I/O module that supports either HD Audio or legacy AC 97 audio standard. Connect one end of the front panel audio I/O module cable to this connector.





- We recommend that you connect a high-definition front panel audio module to this connector to avail of the motherboard's high-definition audio capability.
- If you want to connect a high-definition front panel audio module to this connector, set the Front Panel Type item in the BIOS setup to [HD]. If you want to connect an AC'97 front panel audio module to this connector, set the item to [AC97]. By default, this connector is set to [HD].

14. PCI slot

The PCI slot supports a card such as LAN card, SCSI card, USB card, and other card that complies with the PCI specifications.

15. PCI Express 2.0 x1 slot

This motherboard has a PCI Express 2.0 x1 slot that supports PCI Express x1 network card, SCSI cards, or other card that complies with the PCI Express specifications.

16. PCI Express 3.0/2.0 x16 slot

This motherboard supports a PCI Express 3.0/2.0 x16 graphic card that complies with the PCI Express specifications.

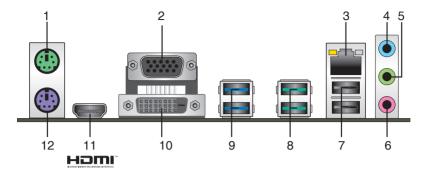
IRQ assignments for this motherboard

	Α	В	С	D	E
PCIE x16	-	shared	-	-	-
PCIE x1_1	shared	-	-	-	-
PCI1	-	-	-	-	shared
LAN	-	-	shared	-	-
HD AUDIO	shared	-	-	-	-
SATA	-	-	_	shared	-
XHCI1	-	-	shared	-	-
XHCI2	-	shared	-	-	-
EHCI1/2/3	-	shared	-	-	-
OHCI	-	_	shared	_	-
Asm1143	-	-		-	shared



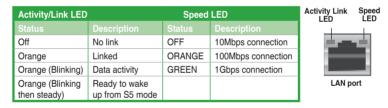
When using PCI cards on shared slots, ensure that the drivers support "Share IRQ" or that the cards do not need IRQ assignments. Otherwise, conflicts will arise between the two PCI groups, making the system unstable and the card inoperable.

1.2.2 Rear panel connectors



- 1. PS/2 Mouse port (green). This port is for a PS/2 mouse.
- Video Graphics Adapter (VGA) port. This 15-pin port is for a VGA monitor or other VGA-compatible devices.
- LAN (RJ-45) port. This port allows Gigabit connection to a Local Area Network (LAN) through a network hub. Refer to the table below for the LAN port LED indications.

LAN port LED indications



- Line In port (light blue). This port connects the tape, CD, DVD player, or other audio sources.
- Line Out port (lime). This port connects a headphone or a speaker. In 4.1-channel, 5.1-channel, and 7.1-channel configurations, the function of this port becomes Front Speaker Out.
- 6. Microphone port (pink). This port connects a microphone.



To configure a 7.1-channel audio output:

Use a chassis with HD audio module in the front panel to support a 7.1-channel audio output.

Audio 2.1, 4.1, 5.1 or 7.1-channel configuration

Port	Headset 2.1-channel	4.1-channel	5.1-channel	7.1-channel
Light Blue (Rear panel)	Line In	Rear Speaker Out	Rear Speaker Out	Rear Speaker Out
Lime (Rear panel)	Line Out	Front Speaker Out	Front Speaker Out	Front Speaker Out
Pink (Rear panel)	Mic In	Mic In	Bass/Center	Bass/Center
Lime (Front panel)	_	_	_	Side Speaker Out



For a 7.1-channel speaker setup, refer to the 7.1-channel configuration in the table.

- USB 2.0 ports These two 4-pin Universal Serial Bus (USB) ports are for USB 2.0/1.1 devices
- USB 3.1 ports These two 9-pin Universal Serial Bus (USB) ports are for USB 3.1 devices
- USB 3.0 ports. These two 9-pin Universal Serial Bus (USB) ports connect to USB 3.0/2.0 devices.
 - Due to USB 3.0 controller limitations, USB 3.0 devices can only be used under a Windows® OS environment and after USB 3.0 driver installation.
 - The plugged USB 3.0 device may run on xHCl or EHCl mode, depending on the operating system's setting.
 - USB 3.0 devices can only be used for data storage.
 - We strongly recommend that you connect USB 3.0 devices to USB 3.0 ports for faster and better performance from your USB 3.0 devices.
- 10. DVI-D port. This port is for any DVI-D compatible device.

DVI-D can not be converted to output from RGB Signal to CRT and is not compatible with DVI-I.

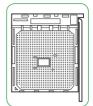
- HDMI port. This port is for a High-Definition Multimedia Interface (HDMI) connector, and is HDCP compliant allowing playback of HD DVD, Blu-Ray, and other protected content.
- 12. PS/2 keyboard port (purple). This port is for a PS/2 keyboard.

1.3 Accelerated Processing Unit (APU)

This motherboard comes with a FM2+ socket designed for AMD® A-series and Athlon™Series processors.



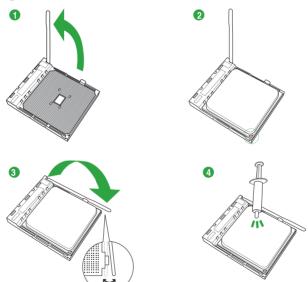
Unplug all power cables before installing the APU.





Ensure that you use an APU designed for the FM2+ socket. The APU fits in only one correct orientation. DO NOT force the APU into the socket to prevent bending the pins and damaging the APU!

Installing the APU





Apply the Thermal Interface Material to the APU heatsink and APU before you install the heatsink and fan if necessary.

1.4 System memory

Overview

This motherboard comes with four Double Data Rate 3 (DDR3) Dual Inline Memory Module (DIMM) sockets. The figure illustrates the location of the DDR3 DIMM sockets:



Channel	Sockets
Channel A	DIMM_A1
Channel B	DIMM_B1

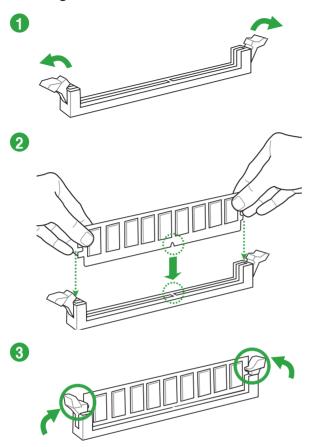


- You may install varying memory sizes in Channel A and Channel B. The system
 maps the total size of the lower-sized channel for the dual-channel configuration. Any
 excess memory from the higher-sized channel is then mapped for single-channel
 operation.
- Always install DIMMs with the same CAS latency. For optimal compatibility, we
 recommend that you install memory modules of the same version or date code (D/C)
 from the same vendor. Check with the retailer to get the correct memory modules.
- Due to the memory address limitation on 32-bit Windows® OS, when you install 4GB or more memory on the motherboard, the actual usable memory for the OS can be about 3GB or less. For effective use of memory, we recommend that you do any of the following:
 - Use a maximum of 3GB system memory if you are using a 32-bit Windows® OS.
 - Install a 64-bit Windows® OS if you want to install 4GB or more on the motherboard.
 - For more details, refer to the Microsoft® support site at http://support.microsoft.com/kb/929605/en-us.

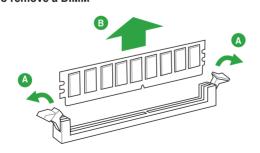


- The default memory operation frequency is dependent on its Serial Presence Detect (SPD), which is the standard way of accessing information from a memory module.
 Under the default state, some memory modules for overclocking may operate at a lower frequency than the vendor-marked value.
- For system stability, use a more efficient memory cooling system to support a full memory load (4 DIMMs).
- Refer to www.asus.com for the latest Memory QVL (Qualified Vendors List)

Installing a DIMM



To remove a DIMM



BIOS information



2.1 Managing and updating your BIOS

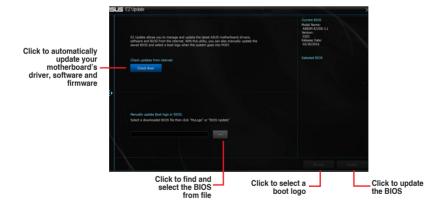


Save a copy of the original motherboard BIOS file to a USB flash disk in case you need to restore the BIOS in the future. Copy the original motherboard BIOS using the ASUS Update utility.

2.1.1 EZ Update

EZ Update is a utility that allows you to automatically update your motherboard's softwares, drivers and the BIOS version easily. With this utility, you can also manually update the saved BIOS and select a boot logo when the system goes into POST.

To launch EZ Update, click EZ Update on the Al Suite 3 main menu bar.





EZ Update requires an Internet connection either through a network or an ISP (Internet Service Provider).

2.1.2 ASUS EZ Flash 2

The ASUS EZ Flash 2 feature allows you to update the BIOS without using an OS-based utility.



Before you start using this utility, download the latest BIOS file from the ASUS website at www.asus.com.

To update the BIOS using EZ Flash 2:

- 1. Insert the USB flash disk that contains the latest BIOS file to the USB port.
- Enter the Advanced Mode of the BIOS setup program. Go to the Tool menu to select ASUS EZ Flash Utility and press <Enter> to enable it.
- 3. Press <Tab> to switch to the **Drive** field.
- Press the Up/Down arrow keys to find the USB flash disk that contains the latest BIOS, and then press <Enter>.
- 5. Press <Tab> to switch to the Folder Info field.
- Press the Up/Down arrow keys to find the BIOS file, and then press <Enter> to perform
 the BIOS update process. Reboot the system when the update process is done.



- This function supports USB flash disks formatted using FAT32/16 on a single partition only.
- Ensure to load the BIOS default settings to ensure system compatibility and stability.
 Select the Load Optimized Defaults item under the Exit menu.
- DO NOT shut down or reset the system while updating the BIOS to prevent system boot failure!



2.1.3 ASUS CrashFree BIOS 3 utility

The ASUS CrashFree BIOS 3 is an auto recovery tool that allows you to restore the BIOS file when it fails or gets corrupted during the updating process. You can restore a corrupted BIOS file using the motherboard support DVD or a USB flash drive that contains the updated BIOS file.



- Before using this utility, rename the BIOS file in the removable device into A88XME31.CAP.
- The BIOS file in the support DVD may not be the latest version. Download the latest BIOS file from the ASUS website at www.asus.com.

Recovering the BIOS

To recover the BIOS:

- 1. Turn on the system.
- Insert the support DVD to the optical drive or the USB flash drive that contains the BIOS file to the USB port.
- The utility automatically checks the devices for the BIOS file. When found, the utility reads the BIOS file and enters ASUS EZ Flash 3 utility automatically.
- The system requires you to enter BIOS Setup to recover BIOS settings. To ensure system compatibility and stability, we recommend that you press <F5> to load default BIOS values.



DO NOT shut down or reset the system while updating the BIOS! Doing so can cause system boot failure!

2.1.4 ASUS BIOS Updater

ASUS BIOS Updater allows you to update the BIOS in DOS environment.



The screen captures used in this section are for reference only and may not be exactly the same as actually shown on your computer screen.

Before updating BIOS

- Prepare the motherboard support DVD and a USB flash drive.
- Download the latest BIOS file and BIOS Updater from http://support.asus.com and save them in your USB flash drive.



NTFS is not supported under FreeDOS environment. Ensure that your USB flash drive is in single partition and in FAT32/16 format.

- Turn off the computer.
- Ensure that your computer has a DVD optical drive.

Booting the system in DOS environment

To boot the system in DOS:

- 1. Insert the USB flash drive with the latest BIOS file and BIOS Updater to the USB port.
- 2. Boot your computer then press <F8> to launch the select boot device screen.
- When the select boot device screen appears, insert the Support DVD into the optical drive then select the optical drive as the boot device.
- When the booting message appears, press <Enter> within five (5) seconds to enter FreeDOS prompt.
- On the FreeDOS prompt, type d: then press <Enter> to switch the disk from Drive C (optical drive) to Drive D (USB flash drive).

Updating the BIOS file

To update the BIOS file:

- 1. On the FreeDOS prompt, type **bupdater /pc /g** and press <Enter>.
- On the BIOS Updater screen, press <Tab> to switch from Files panel to Drives panel then select D:.



- Press <Tab> to switch from Drives panel to Files panel then press <Up/Down or Home/ End> keys to select the BIOS file and press <Enter>.
- After the BIOS Updater checks the selected BIOS file, select Yes to confirm the BIOS update.



The BIOS Backup feature is not supported due to security regulations.

- Select Yes then press <Enter>. When BIOS update is done, press <ESC> to exit BIOS Updater.
- Restart your computer.



DO NOT shut down or reset the system while updating the BIOS to prevent system boot failure.



Ensure to load the BIOS default settings to ensure system compatibility and stability. Select the **Load Optimized Defaults** item under the **Exit** BIOS menu.

2.2 BIOS setup program

Use the BIOS Setup program to update the BIOS or configure its parameters. The BIOS screens include navigation keys and brief online help to guide you in using the BIOS Setup program.

Entering BIOS Setup at startup

To enter BIOS Setup at startup:

Press < Delete> or <F2> during the Power-On Self Test (POST). If you do not press
 Delete> or <F2>. POST continues with its routines.

Entering BIOS Setup after POST

To enter BIOS Setup after POST:

- Press < Ctrl>+< Alt>+< Del> simultaneously.
- Press the reset button on the system chassis.
- Press the power button to turn the system off then back on. Do this option only if you
 failed to enter BIOS Setup using the first two options.



Using the power button, reset button, or the <**Ctr**l>+<**Alt**>+<**De**l> keys to force reset from a running operating system can cause damage to your data or system. We recommend you always shut down the system properly from the operating system.



- The BIOS setup screens shown in this section are for reference purposes only, and may not exactly match what you see on your screen.
- Visit the ASUS website at <u>www.asus.com</u> to download the latest BIOS file for this motherboard.
- Ensure that a USB mouse is connected to your motherboard if you want to use the mouse to control the BIOS setup program.
- If the system becomes unstable after changing any BIOS setting, load the default settings to ensure system compatibility and stability. Select the Load Optimized Defaults item under the Exit menu or press hotkey <F5>.
- If the system fails to boot after changing any BIOS setting, try to clear the CMOS and
 reset the motherboard to the default value. See section 1.2.1 Layout contents for
 information on how to erase the BTC RAM.

BIOS menu screen

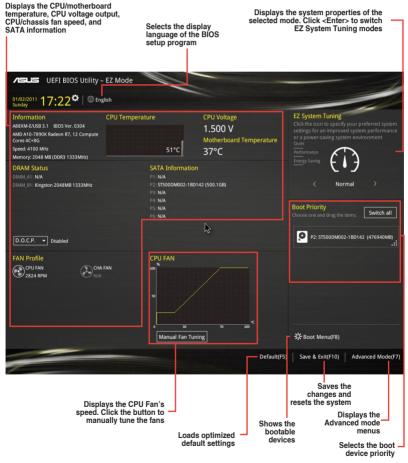
The BIOS setup program can be used under two modes: **EZ Mode** and **Advanced Mode**. You can change modes from the **Exit** menu or from the Exit/Advanced Mode button in the EZ Mode/Advanced Mode screen.

2.2.1 EZ Mode

By default, the EZ Mode screen appears when you enter the BIOS setup program. The EZ Mode provides you an overview of the basic system information, and allows you to select the display language, system performance mode and boot device priority. To access the Advanced Mode, click **Exit/Advanced Mode**, then select **Advanced Mode** or press <F7> for the advanced BIOS settings.



The default screen for entering the BIOS setup program can be changed.





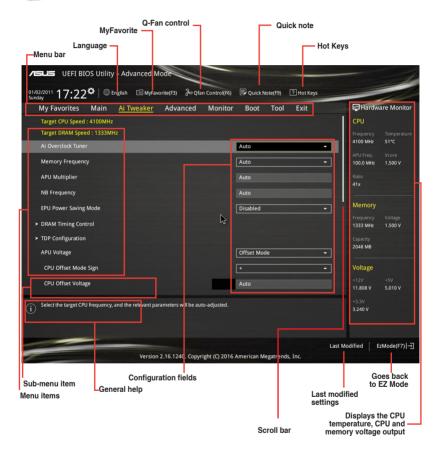
The boot device options vary depending on the devices you installed to the system.

2.2.2 Advanced Mode

The Advanced Mode provides advanced options for experienced end-users to configure the BIOS settings. The figure below shows an example of the **Advanced Mode**.



To access the EZ Mode, click Exit, then select ASUS EZ Mode or press <F7>.



Menu bar

The menu bar on top of the screen has the following main items:

My Favorites	For saving the frequently-used system settings and configuration
Main	For changing the basic system configuration
Ai Tweaker	For changing the overclocking settings
Advanced	For changing the advanced system settings
Monitor	For displaying the system temperature, power status, and changing the fan settings
Boot	For changing the system boot configuration
Tool	For configuring options for special functions
Exit	For selecting the exit options and loading default settings

Menu items

The highlighted item on the menu bar displays the specific items for that menu. For example, selecting **Main** shows the Main menu items.

The other items (My Favorites, Ai Tweaker, Advanced, Monitor, Boot, Tool, and Exit) on the menu bar have their respective menu items.

Submenu items

A greater than sign (>) before each item on any menu screen means that the item has a submenu. To display the submenu, select the item and press <Enter>.

Language

This button above the menu bar contains the languages that you can select for your BIOS. Click this button to select the language that you want to display in your BIOS screen.

MyFavorites (F3)

This button above the menu bar shows all BIOS items in a Tree Map setup. Select frequently-used BIOS settings and save it to MyFavorites menu.

Q-Fan Control (F6)

This button above the menu bar displays the current settings of your fans. Use this button to manually tweak the fans to your desired settings.

Quick Note (F9)

This button above the menu bar allows you to key in notes of the activities that you have done in BIOS.



- The Quick Note function does not support the following keyboard functions: delete, cut, copy and paste.
- You can only use the alphanumeric characters to enter your notes.

Hot keys

This button above the menu bar contains the navigation keys for the BIOS setup program. Use the navigation keys to select items in the menu and change the settings.

Scroll bar

A scroll bar appears on the right side of a menu screen when there are items that do not fit on the screen. Press the Up/Down arrow keys or <Page Up> / <Page Down> keys to display the other items on the screen.

General help

At the bottom left corner of the menu screen is a brief description of the selected item. Use <F12> key to capture the BIOS screen and save it to the removable storage device.

Configuration fields

These fields show the values for the menu items. If an item is user-configurable, you can change the value of the field opposite the item. You cannot select an item that is not user-configurable.

A configurable field is highlighted when selected. To change the value of a field, select it and press <Enter> to display a list of options.

Last Modified button

This button shows the items that you last modified and saved in BIOS Setup.

2.3 Exit menu

The Exit menu items allow you to load the optimal default values for the BIOS items, and save or discard your changes to the BIOS items. You can access the EZ Mode from the Exit menu.



Load Optimized Defaults

This option allows you to load the default values for each of the parameters on the Setup menus. When you select this option or if you press <F5>, a confirmation window appears. Select OK to load the default values.

Save Changes & Reset

Once you are finished making your selections, choose this option from the Exit menu to ensure the values you selected are saved. When you select this option or if you press <F10>, a confirmation window appears. Select OK to save changes and exit.

Discard Changes and Exit

This option allows you to exit the Setup program without saving your changes. When you select this option or if you press <Esc>, a confirmation window appears. Select OK to discard changes and exit.

Launch EFI Shell from USB drives

This option allows you to attempt to launch the EFI Shell application (shellx64.efi) from one of the available USB devices.

Appendices

Notices

Federal Communications Commission Statement

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- · This device may not cause harmful interference.
- This device must accept any interference received including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with manufacturer's instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- · Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.



The use of shielded cables for connection of the monitor to the graphics card is required to assure compliance with FCC regulations. Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

IC: Canadian Compliance Statement

Complies with the Canadian ICES-003 Class B specifications. This device complies with RSS 210 of Industry Canada. This Class B device meets all the requirements of the Canadian interference-causing equipment regulations.

This device complies with Industry Canada license exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Cut appareil numérique de la Classe B est conforme à la norme NMB-003 du Canada. Cet appareil numérique de la Classe B respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

Cet appareil est conforme aux normes CNR exemptes de licence d'Industrie Canada. Le fonctionnement est soumis aux deux conditions suivantes :

- (1) cet appareil ne doit pas provoquer d'interférences et
- (2) cet appareil doit accepter toute interférence, y compris celles susceptibles de provoquer un fonctionnement non souhaité de l'appareil.

Canadian Department of Communications Statement

This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

This class B digital apparatus complies with Canadian ICES-003.

VCCI: Japan Compliance Statement

Class B ITE

この装置は、クラスB情報技術装置です。この装置は、家庭環境で使用することを目的としていますが、この装置がラジオやテレビジョン受信機に近接して使用されると、受信障害を引き起こすことがあります。

取扱説明書に従って正しい取り扱いをして下さい。

VCCI-B

This is a Class B product based on the standard of the VCCI Council. If this is used near a radio or television receiver in a domestic environment, it may cause radio interference. Install and use the equipment according to the instruction manual.

KC: Korea Warning Statement

B급 기기 (가정용 방송통신기자재)

이 기기는 가정용(B급) 전자파적합기기로서 주로 가정에서 사용하는 것을 목적으로 하며, 모든 지역에서 사용할 수 있습니다.

A-2 Appendices

RFACH

Complying with the REACH (Registration, Evaluation, Authorisation, and Restriction of Chemicals) regulatory framework, we published the chemical substances in our products at ASUS REACH website at http://csr.asus.com/english/REACH.htm.



DO NOT throw the motherboard in municipal waste. This product has been designed to enable proper reuse of parts and recycling. This symbol of the crossed out wheeled bin indicates that the product (electrical and electronic equipment) should not be placed in municipal waste. Check local regulations for disposal of electronic products.



DO NOT throw the mercury-containing button cell battery in municipal waste. This symbol of the crossed out wheeled bin indicates that the battery should not be placed in municipal waste.

ASUS Recycling/Takeback Services

ASUS recycling and takeback programs come from our commitment to the highest standards for protecting our environment. We believe in providing solutions for you to be able to responsibly recycle our products, batteries, other components as well as the packaging materials. Please go to http://csr.asus.com/english/Takeback.htm for detailed recycling information in different regions.

Google™ License Terms

Copyright© 2016 Google Inc. All Rights Reserved.

Licensed under the Apache License, Version 2.0 (the "License"); you may not use this file except in compliance with the License. You may obtain a copy of the License at:

http://www.apache.org/licenses/LICENSE-2.0

Unless required by applicable law or agreed to in writing, software distributed under the License is distributed on an "AS IS" BASIS, WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.

See the License for the specific language governing permissions and limitations under the License.

English AsusTek Inc. hereby declares that this device is in compliance with the essential requirements and other relevant provisions of CE Directives. Please see the CE Declaration of Conformity for more details.

Français AsusTek Inc. déclare par la présente que cet appareil est conforme aux critères essentiels et autres dauses pertinentes des directives européennes. Veuillez consulter la déclaration de conformité CE pour plus d'informations

Deutsch AsusTek Inc. erklärt hiermit, dass dieses Gerät mit den wesentlichen Anforderungen und anderen relevanten Bestimmungen der CE-Richtlinien übereinstimmt. Weitere Einzelheiten entnehmen Sie bitte der CE-Konformitätserklärung.

Italiano AsusTek Inc. con la presente dichiara che questo dispositivo è conforme ai requisiti essenziali e alle altre disposizioni pertinenti alle direttive CE. Per maggiori informazioni fate riferimento alla dichiarazione di conformità CF

Русский Компания ASUS заявляет, что это устройство соответствует основным требованиям и другим соответствующим условиям европейских директив. Подробную информацию, пожалуйста, смотрите в лекзаращим соответствия

Български С настоящото AsusTek Inc. декларира, че това устройство е в съответствие със съществените изисквания и другите приложими постановления на директивите СЕ. Вижте СЕ декларацията за съвъествияст за повече информация

Hrvatski AsusTek Inc. ovim izjavljuje da je ovaj uređaj sukladan s bitnim zahtjevima i ostalim odgovarajućim odredbama CE direktiva. Više pojedinosti potražite u CE izjavi o sukladnosti.

Čeština Společnost AsusTek Inc. tímto prohlašuje, že toto zařízení splňuje základní požadavky a další příslušná ustanovení směrnic CE. Další podrobnosti viz Prohlášení o shodě CE.

Dansk AsusTek Inc. Erklærer hermed, at denne enhed er i overensstemmelse med hovedkravene and andre relevante bestemmelser i CE-direktiverne. Du kan læse mere i CE-overensstemmelseserklæring.

Nederlands Asus Tek Inc. verklaart hierbij dat dit apparaat compatibel is met de essentiële vereisten en andere relevante bepalingen van CErichtlijnen. Raadpleeg de CE-verklaring van conformiteit voor meer details.

Eesti Käesolevaga kinnitab AsusTek Inc., et see seade vastab CE direktiivide oluliste nõuetele ja teistele asjakohastele sätetele. Vt üksikasju CE vastavusdeklaratsioonist

Suomi AsusTek Inc. vakuuttaa täten, että tämä laite on CE-direktiivien olennaisten vaatimusten ja muiden asiaan kuuluvien lisäysten mukainen. Katso lisätietoja CE-vaatimustenmukaisuusvakuutuksesta.

Ελληνικά Με το παρόν, η AsusTek Inc. Δηλώνει ότι αυτή η συσκευή συμμορφώνεται με τις θεμελιώδεις απαιτήσεις και άλλες σχετικές διατάξεις των Οδηγιών της ΕΕ. Γία περισσότερες λεπτομέρειες ανατρέξτε στην Δήλωση Συμμόρφωσης ΕΕ.

Magyar Az AsusTek Inc. ezennel kijelenti, hogy a készülék megfelel a CE-irányelvek alapvető követelményeinek és ide vonatkozó egyéb rendelkezéseinek. További részletekért tekintse meg a CE-megfelelőségi nvilatkozatot.

Latviski Līdz ar šo AsusTek Inc. paziņo, ka šī ierīce atbilst būtiskajām prasībām un citiem saistošajiem nosacījumiem, kas norādīti CE direktīvā. Lai uzzinātu vairāk. skatiet CF Atbilstības deklarāciju.

Lietuvių Šiuo dokumentu bendrovė "Asus Tek Inc." pareiškia, kad šis įrenginys atitinka pagrindinius CE direktyvų reikalavimus ir kitas susijusias nuostatas. Daugiau informacijos rasite CE atitikties deklaracijoje.

Norsk Asus Tek Inc. erklærer herved at denne enheten er i samsvar med hovedsaklige krav og andre relevante forskrifter i CE-direktiver. Du finner mer informasjon i CE-samsvarserklæringen.

Polski Niniejszym AsusTek Inc. deklaruje, że to urządzenie jest zgodne z istotnymi wymaganiami oraz innymi powiązanymi zaleceniami Dyrektyw CE. W celu uzyskania szczegółów, sprawdź Deklaracje zgodności CE.

Português A AsusTek Inc. declara que este dispositivo está em conformidade com os requisitos essenciais e outras disposições relevantes das Diretivas da CE. Para mais detalhes, consulte a Declaração de Conformidade CF.

Română Prin prezenta, AsusTek Inc. declară faptul că acest dispozitiv respectă cerințele esențiale și alte prevederi relevante ale directivelor CE. Pentru mai multe detalii. consultați declarația de conformitate CE.

Srpski AsusTek Inc. ovim izjavljuje da je ovaj uređaj u saglasnosti sa ključnim zahtevima i drugim relevantnim odredbama CE Direktiva. Molimo vas. pogledajte CE Deklaraciju o usklađenosti za više detalia.

Slovensky Spoločnosť AsusTek Inc. týmto prehlasuje, že toto zariadenie vyhovuje príslušným požiadavkám a ďalším súvisiacim ustanoveniam smerníc ES. Viac podrobností si pozrite v prehlásení o zhode ES.

Slovenščina AsusTek Inc. tukaj izjavlja, da je ta naprava skladna s temeljnimi zahtevami in drugimi relevantnimi določili direktiv CE. Za več informacij gleite Izjavo CE o skladnosti.

Español Por la presente, AsusTek Inc. declara que este dispositivo cumple los requisitos básicos y otras disposiciones relevantes de las directivas de la CE. Consulte la Declaración de conformidad de la CE para obtener más detalles.

Svenska AsusTek Inc. förklarar härmed att denna enhet är i överensstämmelse med de grundläggande kraven och andra relevanta bestämmelser i CE-direktiven. Se CE-försäkran om överensstämmelse för mer information.

Українська Asus Tek Inc. заявляє, що цей пристрій відповідає основним вимогам відповідних Директив €С. Будь ласка, див. більше подробиць у Декларації відповідності нормам €С.

Türkçe AsusTek İnc., bu aygıtın temel gereksinimlerle ve CE Yönergelerinin diğer ilgili koşullarıyla uyumlu olduğunu beyan eder. Daha fazla ayrıntı için lütfen CE Uyqunluk Beyanına bakın.

Bosanski Asus Tek Inc. ovim potvrđuje da je ovaj uređaj usklađen s osnovnim zahtjevima i drugim relevantnim propisima Direktiva EK. Za više informacija molimo pogledajte Deklaraciju o usklađenosti EK.

A-4 Appendices

ASUS contact information

ASUSTeK COMPUTER INC.

Address 4F, No. 150, Li-Te Rd., Peitou, Taipei 112, Taiwan

Telephone +886-2-2894-3447 Fax +886-2-2890-7798 Web site www.asus.com/

Technical Support

Telephone +86-21-38429911

Fax +86-21-5866-8722, ext. 9101#
Online support http://gr.asus.com/techserv

ASUS COMPUTER INTERNATIONAL (America)

Address 800 Corporate Way, Fremont, CA 94539, USA

Telephone +1-510-739-3777
Fax +1-510-608-4555
Web site http://www.asus.com/us/

Technical Support

Support fax +1-812-284-0883 Telephone +1-812-282-2787

Online support http://qr.asus.com/techserv

ASUS COMPUTER GmbH (Germany and Austria)

Address Harkort Str. 21-23, D-40880 Ratingen, Germany

Fax +49-2102-959931
Web site http://www.asus.com/de
Online contact http://eu-rma.asus.com/sales

Technical Support

Telephone +49-2102-5789555 Support Fax +49-2102-9599-11

Online support http://gr.asus.com/techserv



A-6 Appendices

